the shipping casks are in proper working order. Further information on cask testing, operational protocols, and test and inspection procedures is provided in Sections M.4 and M.5 of the EIS.

8.5 Intermodal Transfer Facilities and Heavy-Haul Trucks

8.5.1 INTERMODAL FACILITY OPERATIONS

8.5.1 (180)
Comment - 8 comments summarized
Commenters said that the range of environmental, social, and economic impacts from the construction and operation of an intermodal transfer station was not adequately addressed in the EIS.

For the Caliente intermodal transfer station, commenters were concerned about the radiological risks to residents of Caliente because of the proximity of the facility to the city. Some wanted to know if the spent nuclear fuel and high-level radioactive waste would be repackaged at the facility, thereby increasing the risks of radiation exposure. Others said that this site is not an appropriate place to build such a facility. Some said that people in Caliente have already been adversely affected by the possibility of having an intermodal transfer station so close to the city and that citizens have become polarized just from the planning and decisionmaking associated with the facility. Others said that such a facility could adversely affect the lifestyle of residents. Commenters were concerned that businesses would not locate in Caliente because of the threat of constructing an intermodal transfer station or would move out if such a facility were constructed.

For the Sloan/Jean intermodal transfer station, commenters said that air quality and health impacts associated with this facility were not addressed in the EIS.

For the Apex/Dry Lake intermodal transfer station, commenters were concerned about the proximity of this facility to Las Vegas.

Response
Section 6.3.3 of the EIS discusses the impacts of Nevada heavy-haul truck implementing alternatives, including the impacts associated with an intermodal transfer station. The discussion indicates that, because spent nuclear fuel and high level radioactive waste casks would not be opened at the intermodal transfer station, the potential for accidents that could threaten the integrity of the casks is remote. These casks would be designed and certified by the Nuclear Regulatory Commission to withstand a range of severe transportation accident conditions, including collision impacts, drops, fires, and immersion in water. These conditions are much more severe than any expected at an intermodal transfer station. Therefore, the radiological risks from accidents to workers at an intermodal transfer station would be low, and the risk to the public from accidents at the facility would be negligible.

Section 6.3.3.1 of the EIS covers the impacts, including socioeconomic impacts, that would be common to the five heavy-haul truck alternatives. For example, it states that the total increase in employment (direct and indirect) that would result from construction of the intermodal transfer station, "… would peak in 2008 and would include about 135 workers. It also states that, "Increases in real disposable income from constructing an intermodal transfer facility would peak in 2008 at between about $2.7 million and $3.1 million." Air quality impacts common to operation of an intermodal transfer station at the Caliente, Apex/Dry Lake, or Sloan/Jean site are listed in Table 6-83. Health and safety impacts common to the alternative locations for an intermodal transfer station are listed in Tables 6–85, 6-86, and 6-87. Specific impacts associated with the construction and operation of an intermodal transfer station for each heavy-haul truck route analyzed are discussed in EIS Section 6.3.3.2.1 to 6.3.3.2.5. Radiological impacts to the health and safety of workers and persons living along transportation routes in Nevada, including impacts to persons who lived in the vicinity of an intermodal transfer station, are included in the results presented in Tables 6-93, 6-107, 6-112, and 6-117. The possible cumulative impacts from the operation of an intermodal transfer station at Caliente for shipments from the Proposed Action and shipments of low-level radioactive waste are discussed in Section 8.4.2.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in

predicting future behavior based on perceptions had advanced sufficiently since the EIS scoping process to enable DOE to quantify the impacts of public risk perception on economic development or property values in potentially affected communities (see Section 2.5.4 and Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate either to Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods by which such impacts could be predicted with any degree of certainty.

- Much of the uncertainty is irreducible.

- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

If Yucca Mountain was recommended and approved as the site for a monitored geologic repository, DOE would strive to provide clear, accurate information to the public regarding the repository and transportation planning, including potential risks.

8.5.1 (328)
Comment - EIS000028 / 0003
As for transporting low-level nuclear waste, a good truck route currently exists from the rail at Yermo, California. That area is practically void of human population. Yermo is isolated and could serve as a rail/truck terminal.

Response
A heavy-haul truck route originating in Barstow or Yermo, California, using State Route 127 would be similar to a route originating in Baker, California. A route originating from Baker using State Route 127 was considered but eliminated from further detailed study (see Section 2.3.3.2 of the EIS). A route originating from Barstow or Yermo would be eliminated from detailed study for reasons similar to that of the Baker route.

8.5.1 (911)
Comment - EIS000139 / 0001
It appears that intermodal transportation is the most effective and efficient way of transporting both low-level and high-level radioactive materials. We definitely would like to see the DOE seriously consider and push, if possible, the intermodal option preferably out of Caliente, Nevada.

Response
DOE has noted the commenter's preference for intermodal transportation in Nevada. However, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. The choice of a rail corridor or intermodal transfer station location and heavy-haul truck route within Nevada would not be based solely on the potential environmental impacts identified in the EIS. DOE would consider factors such as engineering feasibility, safety, input from the State of Nevada and surrounding communities, and cost in its decisionmaking. Consultations also would consider mitigative measures necessary to preclude or reduce potential impacts.

8.5.1 (997)
Comment - EIS000235 / 0003
The Draft EIS does not describe the type of staff that will be required to operate an intermodal facility in Caliente. Such staff will presumably include persons with training in the proper handling of radioactive materials (i.e., radiation health physicist) and emergency first response. The availability of specialists in Caliente would provide a capability to manage risks associated with other hazardous materials being shipped through the community every

day by rail. The Final EIS should characterize the types of specialists who would be required at an intermodal facility and how their presence in Caliente would help to manage existing risks from shipments of hazardous materials through the community.

Response
A preliminary description of the staff at an intermodal station is given in the *Intermodal Transfer Station Preliminary Design* (DIRS 104849-CRWMS M&O 1997). Specific staff capabilities at an intermodal station that could supplement and/or support the surrounding communities emergency response capability, would be addressed during the development of the system under the Acquisition of Waste Acceptance and Transportation Services for the Office of Civilian Radioactive Waste Management (see Section M.3 of the EIS for details). If a decision to proceed with an alternative that includes intermodal transfers was made, detailed designs of the intermodal facility would be developed as well as detailed staffing plans.

However, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada. The choice of a rail corridor or intermodal transfer station location and heavy-haul truck route within Nevada would not be based solely on the potential environmental impacts identified in the EIS. DOE would consider factors such as engineering feasibility, safety, input from the State of Nevada and surrounding communities, and cost in its decisionmaking. Consultations would consider mitigative measures necessary to preclude or reduce potential impacts.

8.5.1 (2431)
Comment - EIS000683 / 0009
In the interest of doing this, we've asked that our local oversight committee give a special attention to identifying the impacts that would be associated with this intermodal facilities in Caliente.

Our officials came out and actually said that they supported having the facility as early as 1995, but the studies so far have not been done to show what the impacts of this would be.

There's no way of knowing what the cumulative impacts would be of this proposal with the possibility of low level nuclear waste shipments through Lincoln County which might use the same facility.

So it's a major concern of mine that though I understand that finally at the late day, a certain amount of money from the County's funding has been diverted to do a study of the risks of this new mobile facility.

The results of the study are not out yet. They will probably barely be out in time to have input to you guys by the end of the comment period, and it's fairly clear that the citizens will not have an opportunity to review these findings or to say whether or not the results are being used to adequately protect the citizens or simply to support a benefits package, which I certainly do not.

Response
DOE cannot comment on the study being conducted by local officials until the study is complete and made available. Actual data generated by the study would be considered as the project develops. The specific impacts associated with the construction and operation of an intermodal transfer station for each heavy-haul truck route analyzed are given in EIS Section 6.3.3.2. Radiological impacts to the health and safety of workers and persons living along transportation routes in Nevada, including impacts to persons who lived in the vicinity of an intermodal transfer station, are included in results presented in the section. The possible cumulative impacts from operation of an intermodal transfer station at Caliente for shipments from the Proposed Action and shipments of low-level radioactive waste are discussed in Section 8.4.2.

8.5.1 (3080)
Comment - EIS000735 / 0008
When the EIS considers intermodal transfer stations, no consideration is given to a potential location in Barstow or Yermo, California. This is a well established rail yard with a large capacity with easy access to route 15 north bound to Baker then northwest though Death Valley and into the southern entrance to the Test Site.

Response
A heavy-haul truck route originating in Barstow or Yermo, California, using Route 127 would be similar to a route originating in Baker, California. A route originating from Baker using Route 127 was considered but eliminated from further detailed study (see Section 2.3.3.2 of the EIS). A route originating from Barstow or Yermo would be eliminated from detailed study for reasons similar to that of the Baker route.

8.5.1 (5407)
Comment - EIS001887 / 0110
Page 2-51; Section 2.1.3.3.3.1 - Intermodal Transfer Stations

This section describes the possible locations, configurations, and operations at an intermodal facility. It points out the increased handling and logistics introduced into any multi-modal transportation campaign to the Yucca Mountain site. It refers to transfer cranes and movement of casks from rail cars to heavy-haul trucks. This added transfer of the casks introduces increased risks to any transportation campaign. This movement, which would not be necessary in a rail-only shipping campaign, increases the possibility of an accident or damage to the shipping casks or the containers inside.

This scenario also contemplates heavy-haul truck transport primarily through congested metropolitan highway systems where impacts of such transport have not been adequately assessed.

The issue of general freight versus dedicated trains is expanded upon in this section. Intermodal transfer station operations would depend on whether the railcars that carried spent nuclear fuel and high-level radioactive waste arrived on dedicated or general freight trains. DOE states that there will be operational differences for the intermodal transfer station between the dedicated train and general freight options. The Draft EIS, however, does not contain sufficient information on these differences to allow an evaluation of the difference in impacts between the two options. The difference between staging requirements for the heavy-haul vehicles for the two options should be described. If general freight is used, the Draft EIS states that the "General freight trains would switch from the main Union Pacific track to an existing or newly constructed passing track." The Draft EIS does not state where the existing or newly constructed passing track would be located. If it is located at the intermodal transfer station, this would significantly alter the design of the station. If a new passing track is constructed at a location independent of the station, this would create potential impacts that have not been evaluated. Even if an "existing passing track" is used, this would probably require the Union Pacific to construct a new passing track for other railroad traffic.

Any delivery by dedicated trains would move directly into the intermodal facility for cask inspection and transfer to trucks. Shipments via general freight would be "set out," as is typical for railroad operations, on a siding at the intermodal facility. Then a "local" or rail yard locomotive would make the final move into the facility. Again, this clearly introduces another move that involves coupling and uncoupling cars, adding another element of potential human error or mechanical failure.

Response
Section 6.3.3 of the EIS discusses the impacts of Nevada heavy-haul truck implementing alternatives, including the impacts associated with an intermodal transfer station. The discussion indicates that, because spent nuclear fuel and high-level radioactive waste casks would not be opened at the intermodal transfer station, the potential for accidents that might threaten the integrity of the casks is remote. These casks would be designed and certified by the Nuclear Regulatory Commission to withstand a range of severe transportation accident conditions, including collision impacts, drops, fires, and immersion in water. These conditions are much more severe than any expected at the intermodal transfer station. Therefore, the radiological risks from accidents to workers at the intermodal transfer would be low, and the risk to the public from accidents at the intermodal transfer facility would be negligible.

The impacts of heavy-haul truck transportation for routes that would pass through the Las Vegas metropolitan area are evaluated in Section 6.3.3.2 of the EIS.

An intermodal transfer concept of operation for both dedicated and general freight train operation has been included in the *Intermodal Transfer Station Preliminary Design* (DIRS 104849-CRWMS M&O 1997). The conceptual design of an intermodal transfer station would have staging for eight heavy-haul vehicles. DOE anticipates that the

staging provided for in the conceptual design would have sufficient staging for heavy-haul vehicles for dedicated or general freight trains. The intermodal transfer station design evaluated in the EIS would accommodate both dedicated and general freight shipments (DIRS 104849-CRWMS M&O 1997). DOE anticipates that operation of an intermodal station would be consistent with current Union Pacific operating practices and would not require construction of an additional passing track at sites in which one exists.

8.5.1 (7073)
Comment - EIS001337 / 0026
Lincoln County and the City of Caliente recommended that alternatives for accomplishing operation of the intermodal facility should be evaluated for their contribution to risk management and local economic benefits. It was suggested that DOE and DOE/contractor approaches should be considered against private development and operation. The County and City requested that options for shared use of the facility by other government (i.e. defense) and private industries should be assessed for their contribution to regional economic development. Alternatives for management of throughput at the facility were suggested for evaluation for their relative contributions to risk management. Of particular concern to the County and City was the potential for buildup of loaded shipping containers at the intermodal transfer site. The County and City asked that the DEIS evaluate the exposure risks associated with alternative numbers of in-transit containers resident at the site. The DEIS does not consider any of the specific intermodal operational issues raised by Lincoln County and the City of Caliente during EIS scoping.

Response
At present, DOE intends to purchase services and equipment from Regional Servicing Contractors who would perform waste acceptance and transportation operations. Section M.3 of the EIS contains more information on routing regulations and operational procedures and protocols DOE would use if the Yucca Mountain site received approval. Section M.3 also contains more detail on the proposed role of the Regional Servicing Contractor.

As discussed in Section 6.3, the EIS provides estimates of the number of shipments that would be received at an intermodal transfer station in a week. Actual rates of receipt, or throughput, would be determined once a mode and route for transportation has been selected. The throughput volumes were used to develop the preliminary intermodal transfer station design, as described in *Intermodal Transfer Station Preliminary Design* (DIRS 104849-CRWMS M&O 1997).

8.5.1 (7076)
Comment - EIS001337 / 0028
Lincoln County and the City of Caliente requested that the DEIS consider the disposition of the intermodal transfer facility following cessation of waste emplacement at Yucca Mountain. Several alternatives were offered by the County and City for consideration by DOE including: (1) abandon the facility at the end of emplacement; (2) maintain the facility during the period of monitored Retrievability (i.e. 50-100 years) in case waste needs to be removed from the site; and (3) sell or deed the facility to another governmental or private party following emplacement of waste. The County and City requested that consideration of these alternatives evaluate impacts upon local economies, impacts upon other public and private users, and barriers to effective relocation of waste from the site in the event removal is required. The DEIS does not consider the fate of an intermodal facility following cessation of waste emplacement at Yucca Mountain.

Response
If the Yucca Mountain site was recommended and approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor or selection of a site for an intermodal transfer station, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews. These additional evaluations would include an assessment of the impacts for alternate closure scenarios for the intermodal transfer station on local economies,

impacts upon other public and private users, and barriers to effective relocation of waste from the site in the event removal is required.

8.5.1 (7184)
Comment - EIS001337 / 0075
Page 2-51 Section 2.1.3.3.3.1. The description of intermodal transfer stations should be refined to address 1) the length of siding required to accommodate waste shipments as well as other materials destined for Yucca Mountain; 2) the number of locomotives required to perform operations in the; 3) whether the types of support facilities which would be required at the site include maintenance of rail equipment; 4) the number of tractors and trailers required; 5) when and where tractor and trailer inspection would occur; 6) what, if any, emergency first response capabilities would resident at the intermodal station.

Response
If the Yucca Mountain site was recommended and approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor or selection of a site for an intermodal transfer station, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

Preliminary designs were developed for the intermodal transfer station for the Draft EIS and the impacts of construction and operation of the intermodal transfer station evaluated and presented in Section 6.3.3 of the EIS. The preliminary design requirements indicated that the length of a siding or passing track would be dependent on use of dedicated train(s) or general freight. In the case of general freight, a 1,400-meter (4,593-foot) passing track or siding would be necessary to allow general freight trains to pull off the mainline and switch to allow the cask cars to be pushed into the railyard (DIRS 104849-CRWMS M&O 1997). The analysis assumed that one local locomotive would be necessary for operations at an intermodal station. An optional railcar maintenance building is shown in the conceptual design of the intermodal transfer station (see DIRS 104849-CRWMS M&O 1997). DOE has estimated that a heavy-haul vehicle configuration with two tractors per trailer would be necessary for transportation of large rail casks (see Section 2.1.3.3.3.2). Two fleet sizes have been assumed for estimating purposes: a 12-transporter fleet all routes from Caliente, and an 8-transporter fleet for the Apex/Dry Lake and Sloan/Jean routes (see DIRS 154675-Ahmer 1998). Locations and times of tractor and trailer inspections for all routes have been included in *Road Upgrades for Heavy Haul Truck Routes* (DIRS 154448-CRWMS M&O 1998). Determination of the need and scope for resident emergency first-response capabilities at the intermodal transfer station would be determined during subsequent environmental and engineering analyses.

8.5.1 (8097)
Comment - EIS001873 / 0003
The Meadow Valley Wash, a perennial stream which flows to Lake Mead via Moapa Valley, is known for heavy flooding which has destroyed the UP rail line more than once. The DEIS states that the Caliente intermodal site is in a 500 year floodplain. However, I believe it has been inundated within the memory of local people. DOE admits that a flood and surface water analysis of the area has not been performed. This is an example of why, in my view, this EIS is insufficient to support a decision to select this or any other transportation mode or route.

Response
As discussed in Section 6.3 of the EIS, the selection of a specific location for an intermodal transfer station would require additional field surveys, environmental and engineering analyses, State and local government consultation, and appropriate National Environmental Policy Act reviews. Sections 3.2.2.2.3.1, L.3.2.6, and L.4.2.2 contain the most recent information on the proximity of the Caliente intermodal transfer station site to floodplains. If DOE selected the Caliente site, it would conduct a more detailed floodplain assessment for public review.

8.5.1 (8359)
Comment - EIS001873 / 0043
P. 3-127. Caliente intermodal site appears to be about 200 meters from the stream.

Response
Section L.3.2.6 of the EIS contains information on flooding and the presence of wetlands at the Caliente intermodal transfer station site. The selection of a specific location of an intermodal transfer station would require additional field surveys, environmental and engineering analyses, State and local government consultation, and appropriate National Environmental Policy Act reviews.

8.5.1 (8381)
Comment - EIS001873 / 0065
P. 6-57. The negative socioeconomic impacts from transportation including accidents are missing here and throughout the DEIS as I have said.

DOE should specifically address the issue of how security requirements around the intermodal sites would affect the residents of Caliente. For example, would access be denied to areas near the facility that are presently available for public use?

Response
Section 6.3.3.1 of the EIS covers the impacts, including socioeconomic impacts, that would be common to the 5 heavy-haul truck implementing alternatives. For example, it states that the total increase in employment (direct and indirect) that would result from construction of the intermodal transfer station, "… would peak in 2008 and would include about 135 workers. It also states that, "Increases in real disposable income from constructing an intermodal transfer facility would peak in 2008 at between about $2.7 million and $3.1 million." Air quality impacts common to operation of an intermodal transfer station located at the Caliente, Apex/Dry Lake, or Sloan/Jean sites are presented in the section. Health and safety impacts common to the alternative locations for an intermodal transfer station are given in tables in the section. The specific impacts associated with the construction and operation of an intermodal transfer station for each heavy-haul truck route analyzed are given in Section 6.3.3.2. Radiological impacts to the health and safety of workers and persons living along transportation routes in Nevada, including impacts to persons who lived in the vicinity of an intermodal transfer station, are included in results presented in the section. The possible cumulative impacts from operation of an intermodal transfer station at Caliente for shipments from the Proposed Action and shipments of low-level radioactive waste are discussed in Section 8.4.2.

DOE has completed a conceptual design of a generic intermodal transfer station. It covers an area of approximately 0.2 square kilometer (50 acres). Security would be achieved by enclosing the entire intermodal transfer station with a security fence, with gated entries at road and rail entrance/exit points, and continuous security monitoring. Access to this facility would be restricted requiring approval from DOE.

Section 2.1.3.3.3.1 of the EIS provides descriptions of the several proposed intermodal transfer stations associated with the heavy-haul truck implementing alternatives. The section addresses size, operations, access, and security of the stations. Sections 6.3.3.1 and 6.3.3.2 discuss the impacts of construction and operation of the facilities at the several proposed sites, including land use, access, and security.

8.5.1 (8666)
Comment - EIS001837 / 0026
The San Bernardino County Association of Governments has been receiving intermodal funding for about a year now. The first time PARD heard the term intermodal was in connection with nuclear waste shipments at the DOE annual conference in Salt Lake City in 1998. [What are] the connections between intermodal funding for the Needles depot (El Garces Harvey House?) and the DOE? Were DOE funds routed through the State Department of Transportation and on to SANBAG and the City of Needles for the preparation of an intermodal nuclear waste transfer station where waste from the Palo Verde Nuclear reactor would be boarded on trains?

Response
Funding of intermodal transportation studies are not a part of environmental impact studies and are not addressed in this EIS.

8.5.1 (8842)
Comment - EIS000869 / 0015
Paragraph six [in Section S.4.1.12] addresses the development of an emergency services team to respond to an accident at the repository but does not address transfer station or transport situations which would involve more members of the public. There are no public HazMat [hazardous materials] teams available qualified to intervene in a nuclear situation. This again appears to be a situation where the DOE is more concerned with its own employees than with the American population.

Response
DOE would, as required by Section 180(c) of the NWPA provide technical assistance and funds to states for training for public safety officials of appropriate units of local government and Native American tribes through whose jurisdictions spent nuclear fuel or high-level radioactive waste would be transported. Therefore, there would be personnel along all the routes qualified to respond to an incident during transportation. Personnel at transfer stations would be trained in responding to an emergency at the station.

In addition, as discussed in Section M.5 of the EIS, if requested by a state or tribal authority, DOE would provide assistance from its Regional Coordinating Offices located across the United States to reduce the consequences of accidents related to the transportation of spent nuclear fuel and high-level radioactive waste to Yucca Mountain. The assistance would involve providing equipment, logistical and medical resources, and qualified personnel as necessary. States and tribes can request and obtain assistance from other Federal agencies including the Federal Emergency Management Agency, Environmental Protection Administration, Nuclear Regulatory Commission, Department of Transportation, and Department of Defense.

Section 6.3.3 of the EIS discusses the impacts of Nevada heavy-haul truck implementing alternatives, including the impacts associated with an intermodal transfer station. The discussion indicates that, because spent nuclear fuel and high-level radioactive waste casks would not be opened at the intermodal transfer station, the potential for accidents that might threaten the integrity of the casks is remote. These casks would be designed and certified by the Nuclear Regulatory Commission to withstand a range of severe transportation accident conditions, including collision impacts, drops, fires, and immersion in water. These conditions are much more severe than any expected at the intermodal transfer station. Therefore, the radiological risks from accidents to workers at the intermodal transfer facility would be low, and the risk to the public from accidents at the intermodal transfer facility would be negligible.

The specific impacts associated with the construction and operation of an intermodal transfer station for each heavy-haul truck route analyzed are given in EIS Section 6.3.3.2. Radiological impacts to the health and safety of workers and persons living along transportation routes in Nevada, including impacts to persons who lived in the vicinity of an intermodal transfer station, are included in results presented in the section. The possible cumulative impacts from operation of an intermodal transfer station at Caliente for shipments from the Proposed Action and shipments of low-level radioactive waste are discussed in Section 8.4.2.

8.5.1 (9560)
Comment - EIS001888 / 0233
The DEIS does not provide a thorough description of intermodal handling operations. What are the risks of cask handling at intermodal sites? Does cask-handling equipment exist? Has it been tested? Who will test it? When? When will a decision about intermodal site selection be made?

Response
The *Intermodal Transfer Station Preliminary Design* (DIRS 104849-CRWMS M&O 1997) contains an operating plan for the proposed station. Sections J.3.3.1, J.3.4.3, and J.3.5.3 of the EIS discuss the risks associated with cask handling at an intermodal transfer station. Commercial nuclear powerplants with dry cask storage use cask-handling equipment similar to the equipment DOE would use at an intermodal station. The equipment design would accommodate a number of cask types. The design effort would occur during detailed design activities for an

intermodal transfer station, and would comply with "Special Lifting Devices for shipping Containers Weighing 10,000 Pounds (4500 kg) or More" (American National Standards Institute standard ANSI.N14.6), against which DOE would test the equipment. In addition, inspections of the equipment by the intermodal transfer station contractor would comply with this standard.

Section 6.3.3 of the EIS discusses the impacts of Nevada heavy-haul truck implementing alternatives, including the impacts associated with an intermodal transfer station. The discussion indicates that, because spent nuclear fuel and high level radioactive waste casks would not be opened at the intermodal transfer station, the potential for accidents that might threaten the integrity of the casks is remote. These casks would be designed and certified by the Nuclear Regulatory Commission to withstand a range of severe transportation accident conditions, including collision impacts, drops, fires, and immersion in water. These conditions are much more severe than any expected at the intermodal transfer station. Therefore, the radiological risks from accidents to workers at the intermodal transfer would be low, and the risk to the public from accidents at the intermodal transfer facility would be negligible.

DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

If the Yucca Mountain site was recommended and approved, DOE would issue at some future date, a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. In this example, DOE would announce a preferred corridor in the *Federal Register* and other media. No sooner than 30 days after the announcement of a preference, DOE would publish its selection of a rail corridor in a Record of Decision. A similar process would occur in the event that DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor or identification of a specific location for an intermodal transfer station, would require additional field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

8.5.1 (9600)
Comment - EIS001888 / 0275
Intermodal Handling Risks

One of the challenges for risk analysts is to completely describe the risks of the activity being analyzed. In this case, the DEIS fails to adequately address the risks of transferring a waste Cask from a rail car to a heavy haul transporter. One of the problems with intermodal transportation is that it increases the number of times the waste package is handled. In past campaigns, most accidents occur due to handling. The DEIS should have examined the safety of intermodal handling based on some proposed handling process. No handling process is described in the DEIS.

Both of the intermodal handling facilities proposed in the DEIS are located in urban Clark County. In the case of the Apex facility, the facility is located near a veterans hospital, the jet fuel storage tanks for an air force base, and burgeoning residential areas. The other proposed intermodal facility, in southern western Clark County, is adjacent to two major hotels. Most of those hotel rooms would look out onto the intermodal-handling yard. All of the approximately 24,000 vehicles that use Interstate 15 to travel to or through Las Vegas would pass over the Union Pacific rail line that would carry the spent fuel to the intermodal facility. In order for the DEIS to be sufficient a Risk Management Plan required for SARA Title III facilities should be prepared as part of the final EIS.

Response
Section 6.3.3 of the EIS discusses the impacts of Nevada heavy-haul truck implementing alternatives, including the impacts associated with an intermodal transfer station. The discussion indicates that, because spent nuclear fuel and high level radioactive waste casks would not be opened at the intermodal transfer station, the potential for accidents that might threaten the integrity of the casks is remote. These casks would be designed and certified by the Nuclear

Regulatory Commission to withstand a range of severe transportation accident conditions, including collision impacts, drops, fires, and immersion in water. These conditions are much more severe than any expected at the intermodal transfer station. Therefore, the radiological risks from accidents to workers at the intermodal transfer would be low, and the risk to the public from accidents at the intermodal transfer facility would be negligible.

The transportation analysis within Nevada is in the conceptual stage. If the decision to utilize an intermodal transfer station was made, the preliminary design phase would address safety analysis, based on a more detailed concept of operations. As part of the design process, a risk identification and management plan would be developed and implemented.

8.5.1 (9604)
Comment - EIS001888 / 0278
In order for the intermodal handling and heavy haul sections of the DEIS to be regarded as complete analyses, it is necessary for the following additional reports or supplements to the DEIS: An analysis of the risks at each proposed intermodal facility. This plan should be prepared in accordance with the Risk Management Plans mandated by the Clean Air Act Amendments of 1996. A revised DEIS that provides a specific analysis of the risks of intermodal handling at each of the proposed facilities should be prepared. The handling procedures at each facility must be described.

Response
Section 6.3.3 of the EIS discusses the impacts of Nevada heavy-haul truck implementing alternatives, including the impacts associated with an intermodal transfer station. The discussion indicates that, because spent nuclear fuel and high level radioactive waste casks would not be opened at the intermodal transfer station, the potential for accidents that might threaten the integrity of the casks is remote. These casks would be designed and certified by the Nuclear Regulatory Commission to withstand a range of severe transportation accident conditions, including collision impacts, drops, fires, and immersion in water. These conditions are much more severe than any expected at the intermodal transfer station. Therefore, the radiological risks from accidents to workers at the intermodal transfer would be low, and the risk to the public from accidents at the intermodal transfer facility would be negligible.

The transportation analysis within Nevada is in the conceptual stage. If the decision to utilize an intermodal transfer station was made, the preliminary design phase would address safety analysis, based on a more detailed concept of operations. As part of the design process, a risk identification and management plan would be developed and implemented.

8.5.1 (10594)
Comment - EIS002122 / 0008
There's no description of the security or adequate description of the security requirements around the possible intermodal transfer sites. For those of us in the county who live near the City of Caliente, would our freedom of motion be limited? Would we be able to climb on the hills overlooking the possible site? How far away is it? How large would the buffer area be, especially considering the fact that a terrorist could from above lob some sort of projectile into the area where these casks would be left over the weekend because of the transportation requirements.

Response
A facility such as this would require a Site Safeguards and Security Plan that is site specific. At this time, DOE has not chosen the heavy-haul truck mode of transportation. Should heavy-haul truck be chosen as the mode, addition decisions would be required on the specific route and the specific location of the intermodal transfer station.

DOE has completed a conceptual design of a generic intermodal transfer station. It covers an area of approximately 0.2 square kilometer (50 acres). Security would be achieved by enclosing the entire intermodal transfer station with a security fence, with gated entries at road and rail entrance/exit points, and continuous security monitoring. Access to this facility would be restricted requiring approval from DOE.

Section 2.1.3.3.3.1 of the EIS provides descriptions of the several proposed intermodal transfer stations associated with the heavy-haul truck implementing alternatives. The section addresses size, operations, access, and security of the stations. Sections 6.3.3.1 and 6.3.3.2 discuss the impacts of construction and operation of the facilities at the several proposed sites, including land use, access, and security.

8.5.2 HIGHWAY UPGRADES

8.5.2 (5411)
Comment - EIS001887 / 0114
Page 2-54; Section 2.1.3.3.3.2 - Highway Routes for Heavy-Haul Shipments

The Draft EIS assumes that most borrow material for construction could come from existing Nevada Department of Transportation borrow areas, if the State agreed. Most road design projects attempt to balance cut and fill requirements during construction of the roads. Therefore, it is not reasonable to assume that borrow material will be available in existing borrow areas for the extensive fill requirements necessary to construct truck climbing lanes and other road improvements. Obtaining fill material from other areas could result in significant impacts not discussed within the Draft EIS.

The last sentence in the second paragraph of the first bullet says, "This parking area would be near the U.S. 6 and U.S. 95 interchange at Tonopah." The point where U.S. 6 and U.S. 95 meet in Tonopah is an intersection in town. It is hardly a place to park this type of truck. This is a busy intersection, not a freeway-type interchange.

Response
DOE developed a *Cost Estimate for Heavy Haul Truck Transport Design* (DIRS 154675-Ahmer 1998). This study identifies the estimated embankment material and aggregate material needed to upgrade roads for use by heavy-haul trucks. For example, the cost estimate for the Caliente Route identifies the need for approximately 1.5 million cubic meters (2 million cubic yards) of embankment material, and approximately 190,000 cubic meters (250,000 cubic yards) of aggregate base material. If this material was not available in the Nevada Department of Transportation's current borrow areas, the material would have to be purchased from commercial borrow material suppliers, unless the Project can negotiate borrow area development with the Bureau of Land Management or private landowners in local areas. Details of the borrow requirements and sources would be developed in the detail design, should heavy-haul trucks be selected as the transportation mode in Nevada. The analysis in Section 6.3.3 of the EIS includes estimates of impacts to land areas from which borrow materials would be taken for upgrading roads.

The analysis of the road upgrades (DIRS 154448-CRWMS M&O 1998) includes a potential location for an overnight truck stopping area approximately 48 kilometers (30 miles) east of Tonopah along U.S. 6. A specific location for such a stop has not been identified. DOE does not propose to construct a safe parking area at the U.S. 6 and U.S. 95 interchange in Tonopah.

8.5.2 (5716)
Comment - EIS001887 / 0330
Page 6-35; Section 6.3 - Nevada Transportation

Land Use and Ownership: The Draft EIS makes note of land use and ownership impacts to landowners due to the creation and use of a branch rail line or heavy-haul facility. It does not account for impacts to the Nevada Department of Transportation (NDOT) as a landowner. Negative impacts include corridor degradation, loss of pavement structure, and operational disruptions (queues, etc.). DOE has also failed to assess what will happen to facilities, shipments, and operations when the time comes to rebuild or resurface the roadways sustaining this shipping campaign. These roadways will have to be refurbished, since axle loads of the kind proposed for spent fuel and HLW [high-level radioactive waste] shipments were never anticipated and would accumulate and reduce the service life of affected roadways. The Draft EIS does not consider the fact that during a 24 year shipping campaign, roadways will deteriorate and must be rebuilt. In section 6.3.3.1, the Draft EIS states that resurfacing would occur every eight years. What 'ESAL' calculations are driving this number? What happens to shipments when highway construction closes down roadways for months at a time? In addition, it would appear that field inspections of 'choke points' and areas of operational concern have not been effectively carried out. Areas such as Hancock Summit, for example, may not be able to legally allow a heavy-haul vehicle configuration to pass through the summit and roadway cut. The turning radius may be too small to allow the vehicle to traverse the roadway.

Response
Impacts such as loss of pavement structure and operational disruptions have been addressed in analysis presented in the EIS (see EIS Sections 6.3.1 and 6.3.3.1). As described in *Road Upgrades for Heavy Haul Routes*

(DIRS 154448-CRWMS M&O 1998), use of the conceptual heavy-haul transport vehicle, which is also described in Section 2.1.3.3.3.2, and roadway geometry were taken into account. In addition, for this analysis field surveys of routes were made to determine if roadway geometry would support use of the transport vehicle. A road upgrade design would mitigate areas of operational concern and "choke points" through lane widening, intersection widening, and/or a truck alternate route (DIRS 154448-CRWMS M&O 1998; DIRS 154824-Ridilla et al. 1997). In addition, because transport and escort vehicles would compromise only a small percentage of the average daily traffic along routes, impacts such as corridor degradation would be small.

Traffic control measures would be used in order to accommodate heavy-haul truck shipments during times of road maintenance of routes.

The potential road upgrades that were evaluated in the EIS analysis for each candidate heavy-haul truck route can be found in Section J.3.1.2 of the EIS. These upgrades were based on projected annual average daily traffic for 2010 to 2033. These annual average daily traffic estimates were used to calculate estimated Equivalent Single Axle Loads for 2010 through 2033 combined with estimates for the 17-axle heavy-haul vehicle configuration assumed for the analysis. These combined Equivalent Single Axle Loads were used to calculate the necessary pavement thickness of initial road upgrades with assumed subsequent pavement overlays every 8 years and a road serviceability life of 20 years (see DIRS 154448-CRWMS M&O 1998).

8.5.2 (7069)
Comment - EIS001337 / 0024
Lincoln County and the City of Caliente noted that the DEIS should evaluate alternatives for establishing and maintaining a highway system capable of withstanding repeated heavy-haul loads. They further suggested that where new road construction is required, improved yet unpaved surfaces should be evaluated against pavement. The County and City encouraged DOE to evaluate risk management benefits associated with options for construction of dedicated travel lanes in areas of excessive grades or poor sight distance. The DEIS does not consider paved versus unpaved roadway improvement alternatives. Evaluation of the risk management benefits potentially associated with construction of dedicated travel lanes was not addressed within the DEIS.

The County and City recommended several operational alternatives for consideration within the DEIS including escorted versus unescorted shipments; time of day travel restrictions versus unrestricted transport; and use of local versus nonlocal trucking firms. The first two were recommended for consideration for their contribution to risk management. DOE was encouraged to evaluate the third option set to determine regional economic benefits. The DEIS does not consider specific heavy-haul operational alternatives offered by Lincoln County and the City of Caliente during scoping.

Response
DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

An EIS reference (DIRS 154675-Ahmer 1998) includes a "Cost Estimate for Heavy Haul Truck Transport Design." It includes a detailed cost estimate for the design, construction, and management of upgrades for public roads for each of the five candidate heavy-haul truck routes. DOE based the estimated costs presented in Section 6.3.3.2 of the EIS on those estimates, which include lane widening, truck lane and turnout construction, pavement upgrades, intersection upgrades, and shoulder upgrades. Cost estimates developed for highway upgrades associated with heavy-haul truck scenarios include costs for annual maintenance of the roads. Table J-89 summarizes road upgrades for a proposed Caliente Route.

Before DOE used a heavy-haul truck transportation implementing alternative it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways. The studies would include traffic analysis to identify the specific turnout requirements for

each road section based on the estimated increase in annual average daily traffic over the life of the project. Turnouts preliminarily identified by the analysis [see *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998)] were included in estimating the cost for road upgrades. Although the installation of additional lanes for the proposed routes is not necessary to maintain level of service for the roads that are not heavily used, turnout locations and the number of turnouts could be adjusted to maximize their effectiveness.

DOE would follow State of Nevada requirements for heavy-haul truck shipments. Such requirements include time-of-day travel restrictions and escorts. DOE has developed a draft Request for Proposal for Regional Servicing Contractors for waste acceptance and transportation. The contractor(s) would be responsible for shipping arrangements and transportation services in the servicing region(s). DOE plans for transportation operations are discussed in Section M.3 of the EIS.

8.5.2 (7186)
Comment - EIS001337 / 0125
Page 2-54 Highway Routes for Heavy-Haul Shipments - It is unacceptable to Lincoln County that the DOE is only considering adding up to 4 feet to the existing shoulders. Some of the existing shoulders are only 2-3 feet wide which means at a maximum the shoulder would be only 7 feet wide. With the heavy-haul truck and cask being up to 10 1/2 feet wide, DOE should insure that the shoulders are at least 12 feet wide so that the vehicle could be safely and completely removed from the main part of the road. This section also discusses the routes from each of the intermodal transfer stations to Yucca Mountain. Having to modify intersections in the vicinity of Hiko, SR 375 and U.S. 6 to accommodate the 220 foot long heavy-haul trucks should be relatively easy, however, if any of the intersections at I-15, the new beltway, U.S. 93 or U.S. 95 are inadequate to handle the transporter, both in terms of weight or geometry, this could be a show stopper. DOE needs to evaluate these [intersections] carefully before considering them to be feasible routes.

Also, DOE needs to consult with the Nevada Department of Transportation to determine if NDOT [Nevada Department of Transportation] would issue a heavy-haul permit on these routes.

Furthermore, turnouts located every 20 miles is not acceptable and would adversely impact commerce, tourism and general transportation in Lincoln County and create potentially unsafe passing conditions. This issue would be mitigated via construction of dual lanes in each direction on any highway in Lincoln County used for heavy-haul transport.

Response
DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

Section J.3.1.2 of the EIS provides tables that list potential upgrades for roads in Nevada to handle heavy-haul trucks. This information is summarized from reference (DIRS 154448-CRWMS M&O 1998). The road widening proposed for the two lane roads includes widening two-lane roads to two 4.3-meter (14-foot)-wide lanes with a 0.6-meter (2-foot) shoulder on each side. Existing road widths along the candidate routes for heavy-haul trucks include two 3.7-meter (12-foot) lanes and shoulder widths ranging from 0.3 to 0.6 meter (1 to 2 feet). The existing 3.7-meter-wide lanes support maximum legal vehicle widths of 2.6 meters (8.5 feet). The proposed 4.3-meter lanes would be sufficient for a 3-meter (10-foot)-wide heavy haul transporter. The 0.6-meter shoulder width provides additional road width for the transporter in transit and would help reduce pavement "breakout" along the edge of the road. Truck turnouts would be used to remove a transporter from travel lanes, if needed. For details, see *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998).

Interstate System intersections were evaluated in the analysis discussed above. Costs associated with upgrading those intersections to support heavy-haul truck transport were included in costs assumed for analysis in the EIS [for additional information, see *Cost Estimate for Heavy Haul Truck Transport Design* (DIRS 154675-Ahmer 1998)].

As described in the analysis *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998), informal discussions were held with the Nevada Department of Transportation to identify preliminary road upgrade requirements. Permits for heavy-haul trucks have not been discussed with the Nevada Department of Transportation. However, the State routinely issues travel permits to operators of heavy-haul trucks.

Before DOE used a heavy-haul truck transportation implementing alternative, it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways. The studies would include traffic analysis to identify the specific turnout requirements for each road section based on the estimated increase in annual average daily traffic over the life of the project. Turnouts preliminarily identified by the analysis [see *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998)] were included in estimating the cost for road upgrades. Although the installation of additional lanes for the proposed routes is not necessary to maintain level of service for the roads that are not heavily used, turnout locations and the number of turnouts could be adjusted to maximize their effectiveness.

8.5.2 (11312)
Comment - EIS001814 / 0041
DEIS Page 6-11
The potential impacts from upgrading Nevada highways for heavy-haul truck use would be small because modifications to roads would occur in previously disturbed rights-of-way.

The amount of upgrade required varies significantly between the various heavy-haul route options. Portions of the Caliente Chalk Mountain route will require significant upgrades, resulting in much more impact than some of the other route segments. Realigning roads to avoid significant grades and to improve curvatures will impact areas outside of current rights-of-way. The impact of the heavy-haul alternative on critical habitat for wildlife will be similar to that discussed above for the rail line alternative.

Response
The road upgrades proposed for candidate routes for heavy-haul trucks include (1) increasing the pavement thickness to meet the requirements of the heavy-haul truck axle loads, (2) increasing the lane width and shoulder width to accommodate the width of the 10-ft wide transporters, and (3) installing truck lanes and turnouts adjacent to the existing pavement to allow additional lanes for passing vehicles. All proposed upgrades would occur in existing highway rights-of-way. The upgrades would not change road alignment or hill grade. The routes were evaluated for heavy-haul truck maneuverability, and no unacceptable conditions were identified. Therefore, no critical habitat disturbance has been identified. However, before DOE used a heavy-haul truck transportation implementing alternative, it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways.

8.5.2 (11981)
Comment - EIS000688 / 0003
The second should wait till tomorrow as you commute back to Las Vegas. Try to envision making the trip on that narrow curvy round between here and Alamo in a truck that's 270 feet long, has forty wheels, two engines and two drivers and weighs almost 300,000 pounds, and then go back to Washington, D.C. and tell someone they need to rethink their transportation plan.

Response
At this time, the heavy-haul truck implementing alternatives for transporting spent nuclear fuel and high-level radioactive waste to the proposed repository are conceptual. Section 2.1.3.3.3.2 of the EIS shows a concept for such a heavy-haul truck. Proposed road upgrades to allow use of such trucks, such as improvements to pavement and construction of turnouts and truck passing lanes, would mitigate impacts on congested roads, traffic flow, and highway infrastructure. However, before DOE used a heavy-haul truck transportation implementing alternative it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways.

DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly

legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

8.5.3 HEAVY-HAUL TRUCK OPERATIONS

8.5.3 (190)
Comment - 33 comments summarized
Commenters stated that the Draft EIS did not adequately demonstrate either the feasibility of implementing a heavy-haul truck scenario or evaluate the impacts if such a scenario was implemented. Commenters stated that the implementation of such an approach is totally unprecedented in the United States and were concerned that, since heavy-haul trucks are slow moving oversized vehicles, their presence on the roads would cause more accidents and result in the effective loss of use of the major arterial roads. Commenters stated that DOE would need to consult with the Nevada Department of Transportation before considering heavy-haul truck transport of spent nuclear fuel and high-level radioactive waste as a viable option. Commenters questioned whether the postulated routes would even be feasible for heavy-haul trucks and if additional highway lanes would have to be constructed to accommodate the size of the vehicles. They stated that detailed surveys of roads, bridges, and overpasses would be needed to ensure that heavy loads could be handled. Another commenter was concerned about the potential cost of having to build bypasses to either go around or through towns because the trucks would be so large they would not be able to make a right-angle turn.

Commenters stated that the heavy-haul truck analysis was deficient. Commenters stated that conclusions regarding changes in level of service in congested areas such as Las Vegas were not supported by the analysis and that no evidence was presented to support the speed assumptions [that is, 32 to 48 kilometers (20 to 30 miles) per hour] made for the heavy-haul truck scenario. If the actual speeds were less, traffic impacts would be exacerbated. Other commenters noted that the impacts to normal traffic flows on heavy-haul truck routes were grossly underestimated considering convoy length and frequency and slower travel speeds. Because disruptions on congested highways often continue after the removal of the cause, the duration of the traffic flow disruption would be longer than the time the vehicle would travel on the highways. Commenters also stated that because of the turning radius requirements for heavy-haul trucks, certain intersections and road segments might have to be shut down to allow passage of heavy-haul trucks. Commenters stated that the Draft EIS did not consider in-transit refueling requirements, safety, security, and the perceived risk of overnight parking for heavy-haul trucks.

Other commenters stated that the EIS did not include analysis of accident rates for this type of vehicle or of accident rates for other vehicles caused by the heavy-haul vehicle. Commenters were concerned that the cost to upgrade candidate heavy-haul truck routes in problem areas such as through Hancock Summit, Tonopah, and Goldfield could be 3 to 10 times greater than Draft EIS estimates. Another commenter said that the Nevada highway system as it now exists could not sustain the accumulation of axle loads this type of shipping campaign would produce and that infrastructure improvements, including lane construction and widening, would be required in both directions for almost the entire length of the heavy-haul truck routes evaluated in the Draft EIS.

Commenters were concerned that the use of heavy-haul trucks would increase traffic congestion in major metropolitan areas such as Las Vegas or in smaller communities along the route. Others were concerned that highway travel times could increase because of the use of these vehicles and questioned what the impact would be on local commerce and air quality. Some commenters stated that Interstate System highways could not be used and that the roads might have to be closed to all other traffic.

Response
DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. If the Yucca Mountain site was approved, DOE would issue at some future date a Record of Decision to select a mode of transportation. If, for example, mostly rail was selected (both nationally and in Nevada), DOE would identify a preference for one of the rail corridors in consultation with affected stakeholders, particularly the State of Nevada. A similar process would occur if DOE selected heavy-haul truck as its mode of transportation in Nevada. Other transportation decisions, such as the selection of a specific rail alignment within a corridor, would require additional

field surveys, State and local government and Native American tribal consultations, environmental and engineering analyses, and appropriate National Environmental Policy Act reviews.

At this time, the heavy-haul truck alternatives for transporting spent nuclear fuel and high-level radioactive waste to the proposed repository are in the conceptual stages of development, although preliminary design and engineering studies have been conducted for the heavy-haul truck options (see DIRS 154448-CRWMS M&O 1998; DIRS 154824-Ridilla et al. 1997). These studies identify potential upgrades for mitigating the potential impacts of the heavy-haul truck concept shown in Figure 2-29 of the EIS.

Based on the analysis mentioned above, heavy-haul truck transportation is technically feasible and its costs would be comparable to those for rail transportation. Sections of the Caliente route such as Hancock Summit and affected communities have been evaluated and are feasible options if the recommended road upgrades were completed. The basis for the cost of upgrading the Caliente heavy-haul truck roads are a result of engineering analysis, limited discussions with the Nevada Department of Transportation, input from heavy-haul trucking companies, and actual cost estimates from highway contractors in Nevada. This information is presented in *Cost Estimate for Heavy-Haul Truck Transport Design* (DIRS 154675-Ahmer 1998). This reference includes detailed cost estimates for the design, construction, and management of the initial road upgrades for public roads for each of the five heavy-haul truck routes. DOE believes this is an adequate technical basis to support the EIS cost estimates for the Caliente and other heavy-haul truck routes.

DOE has received input from heavy-haul truck companies on the estimated speed of the heavy-haul vehicle identified in the EIS. The speed depends on the highway grade. At 0-percent grade, the estimated speed is 68 kilometers (42 miles) per hour and at 4-percent grade, 24 kilometers (15 miles) per hour. Thus, an average speed of 32 to 48 kilometers (20 to 30 miles) per hour for an entire trip does not seem unreasonable. The State of Nevada restricts heavy-haul truck transport to daylight hours only. Thus, intermediate overnight stops would be necessary for the longest of the heavy-haul truck routes. Sections 6.3.3.2.1 through 6.3.3.2.3 of the EIS identify the heavy-haul truck routes that would require an overnight stop. The trucks would carry sufficient fuel to travel the entire one-way distance before refueling.

DOE calculated heavy-haul truck impacts using the Primary road rates in *State-Level Accident Rates of Surface Freight Transportation: A Reexamination* (DIRS 103455-Saricks and Tompkins 1999). Although the document does not explicitly address heavy-haul truck accident rates, DOE believes it provides the latest reasonably available data, as relevant to heavy-haul truck as it is to legal-weight truck transport. The accident rates used in the analysis are conservative because of the special precautions taken with heavy-haul truck shipments to prevent accidents, such as restricting travel to daylight hours and providing escort vehicles in front and behind the trucks. The heavy-haul trucks could affect the accident rates for other vehicles. However, the additional precautions described above in addition to the planned road improvements would mitigate these effects.

Section 6.3.3.1 of the EIS states that most of the highways that heavy-haul truck shipments would use are classified as having freely flowing traffic without delays and that the addition of 11round trips each week should not affect the level of service. The EIS also states that the slow-moving heavy-haul trucks could present a traffic obstruction that increased congestion, delayed other vehicles, and caused short queues to form between turnout areas, even after the shipment passed. However, given the low frequency of heavy-haul truck shipments, congestion would occur predominantly on relatively short segments of the heavy-haul truck routes and mitigation measures could be implemented to alleviate congestion concerns.

DOE would meet all Federal requirements for safety and security of the heavy-haul trucks and comply with the conditions of the Nevada Department of Transportation permits, including restrictions that lead to the need for overnight parking areas. The heavy-haul trucks would be escorted at all times, providing safety and security for the vehicles in transit, including warning other drivers on the highway of the slow-moving, oversized vehicles. Restricting the heavy-haul trucks to travel only during daylight hours is a safety-related requirement that would ensure the shipment was visible to other drivers. DOE anticipates that security systems and personnel would be provided at the overnight parking sites. Preliminary sites for the overnight parking areas are identified in Sections 6.3.3.2.1 to 6.3.3.2.3 of the EIS for each heavy-haul truck implementing alternative that would require overnight parking. As discussed in Section 6.3.3.1, workers at an overnight parking area would receive only small radiation doses because the vehicles would not be unloaded. Table 2-10 lists air quality impacts for all heavy-haul truck

implementing alternatives. Section 6.3.3.1 discusses the derivation of the air quality impacts of heavy-haul truck transportation.

In light of the comments received on the Draft EIS concerning perceived risk, DOE examined relevant studies and literature on perceived risk and stigmatization of communities to determine whether the state-of-the-science in predicting future behavior based on perceptions had advanced sufficiently since the scoping process for the EIS to enable DOE to quantify the impact of public risk perception on economic development or property values in potentially affected communities (see Section 2.5.4 and Appendix N of the EIS). Of particular interest were those scientific and social studies carried out in the past few years that directly relate to either Yucca Mountain or to DOE actions such as the transportation of foreign research reactor spent nuclear fuel. In addition, DOE reevaluated the conclusions of previous literature reviews such as those conducted by the Nuclear Waste Technical Review Board and the State of Nevada, among others. DOE has concluded that:

- While in some instances risk perceptions could result in adverse impacts on portions of a local economy, there are no reliable methods whereby such impacts could be predicted with any degree of certainty.

- Much of the uncertainty is irreducible.

- Based on a qualitative analysis, adverse impacts from perceptions of risk would be unlikely or relatively small.

While stigmatization of southern Nevada can be envisioned under some scenarios, it is not inevitable or numerically predictable. Any such stigmatization would likely be an aftereffect of unpredictable future events, such as accidents, which would not be expected to occur. As a consequence, DOE addressed but did not attempt to quantify any potential for impacts from risk perceptions or stigma in this Final EIS.

If Yucca Mountain was approved as the site for the geologic repository, DOE would continue to provide clear, accurate information to the public regarding the potential risks of a repository at the site and of transporting spent nuclear fuel and high-level radioactive waste to the site.

8.5.3 (776)
Comment - EIS000096 / 0005
Third, the document grossly underestimates HHT [heavy-haul truck] routine radiation doses to members of the public along the route, particularly in Tonopah and Goldfield. Stop-times and reduced speeds due to intersections, sharp curves, school zones, and other local conditions could result in significant cumulative exposures within 150 yards of the highway.

Response
In responding to public comments regarding individuals in Nevada who live close to candidate transportation routes, DOE used information from a recent report prepared for the City of North Las Vegas (DIRS 155112- Berger Group 2000). This report presents suggested assumptions for a hypothetical maximally exposed individual who lived 15 meters (49 feet) from a roadway used by heavy-haul trucks and who would be present and stay at that location, when, over the 24 years, each shipment stopped for 1 minute. DOE believes that such an exposure scenario is highly unlikely and therefore unrealistic. Nonetheless, DOE estimated the maximum cumulative radiation dose to this hypothetical individual would be about 520 millirem over 24 years of the Proposed Action (see Section J.1.3.2.2.1 of the EIS). This dose would lead to an estimated increase in risk of cancer of 1 in 4,000 over the individual's lifetime. In addition, the analysis in the EIS considered other potential maximally exposed individuals who could live along routes in Nevada. These included:

- A person in Alamo living in a residence approximately 5 meters (15 feet) from U.S. 93 where heavy-haul trucks could pass who could receive a dose of 25 millirem over 24 years;

- A person who could be in the courthouse or fire station in Goldfield, Nevada approximately 5 meters (15 feet) from U.S. 95 where heavy-haul trucks could pass, who could receive a dose of 56 millirem over 24 years;

For perspective, cancer from all other causes is fatal to about 1 in 4 persons.

8.5.3 (1173)
Comment - EIS000229 / 0006
The HHT [heavy-haul truck] routes identified in the DEIS do not meet U.S. Nuclear Regulatory Commission (NRC) safeguards criteria. A curious deficiency in the DEIS HHT routing analysis is DOE's apparent ignorance of the NRC safeguards route approval process and criteria. Advance route approvals are part of a safeguards system designed to "[m}inimize the possibilities for radiological sabotage of spent fuel shipments, especially within heavily populated areas..." [10CFR73.37(a)(1)(i)] In 1980, NRC issued a regulatory guidance document [NUREG-0561, Rev.1] which identified five types of route characteristics that receive special consideration when Commission staff review requests for route approval: (1) routes through highly populated areas; (2) routes which would place the shipment or the escort vehicle in a significantly tactically disadvantageous position (for example, tunnels which would prevent the escort vehicle from maintaining continuous surveillance of the shipment vehicle); (3) routes with marginal safety design features (for example, two-lane routes, absence of guard rails, etc.); (4) routes with limited rest and refueling locations; and (5) routes where responses by local law enforcement agencies, when requested, would not be swift or timely. None of the HHT routes identified in the DEIS meet the safeguards routing criteria established by the NRC.

Response
The five candidate heavy-haul truck routes in the EIS represent reasonable alternatives using existing public highways in Nevada. DOE is required by the National Environmental Policy Act implementing regulations to evaluate a range of reasonable alternatives in addition to its preferred alternative.

The Nuclear Regulatory Commission (NRC) issued guidance to provide added protection of spent nuclear fuel shipments against sabotage and diversion (DIRS 154766-NRC 1980). This document contains route selection criteria used by the Commission. Within the section of the document titled "Route Selection Criteria," a brief explanation is given as to the use of these criteria:

> The following are descriptions of criteria frequently used by the NRC staff to determine the preferability and acceptability of spent fuel shipment planned routes and alternative routes. These criteria apply generally to road, rail and sea modes. In the case of road shipments, in particular, Interstate System highways typically best satisfy these criteria.
>
> Likelihood of swift local law enforcement agency (LLEA) response. Routes that permit more timely responses by the LLEA when assistance is requested are preferred.
>
> Avoidance of tactically disadvantageous positions. Routes are preferred which avoid passage through areas including features or terrain which would place the shipment or shipment escorts in significantly tactically disadvantageous positions (for example, passage through long tunnels or over bridges spanning heavily populated areas).
>
> Availability of appropriate rest and refueling stops. Road shipment routes should feature sufficient locations for rest and refueling stops to allow flexibility in adjusting schedules to accommodate unexpected situations.
>
> Availability of good transportation safety design features. Road and rail routes featuring advanced safety design features (for example, divided highways, guard rails, limited access highways for road shipments; high grade track for rail shipments) are preferred over those including portions that are in disrepair or obsolescent (DIRS 154766-NRC 1980).

These criteria do not include "routes through highly populated areas" as a route characteristic that should receive special consideration when Commission staff members review requests for route approval, as stated by the commenter.

In addition, no route would meet the highest standards of these criteria over its entire length. However, the five candidate routes for heavy-haul trucks that are analyzed in the EIS would meet the overall standards of these criteria if the proposed road upgrades to permit use by the trucks were completed.

As stated in Section 2.3.3.2 of the EIS, "The Department identified highway routes for heavy-haul trucks, and associated intermodal transfer station locations to provide reasonable access to existing mainline railroads, to minimize transport length from an existing mainline rail interchange point, and to maximize the use of roads identified by the Nevada Department of Transportation for the highest allowable axle load limits."

8.5.3 (1267)
Comment - EIS002043 / 0005
In the section that discusses heavy-haul highway routes (Pg. 2-54), the DEIS identifies that shoulder widening and the construction of turnout and truck lanes would occur as needed along the side of the existing pavement and shoulders would be widened from 1 to 4 feet. The shoulders should be widened sufficiently for the transporter to be pulled off the main part of the road and away from the fast moving traffic.

Also, DOE only proposed to provide turnouts every 5 to 20 miles. Along U.S. 95 turnouts at 5 miles would be insufficient and would create additional risk to travelers. People are accustomed to traveling along this route at a high rate of speed. If travelers were forced to follow a long slow moving convoy carrying nuclear waste, drivers would make risky vehicle passes for the purpose of decreasing travel time. DOE should plan to construct two lanes each way if heavy-haul transporters are used.

Response
The road widening proposed for the two lane roads includes widening two-lane roads to two 4.3-meter (14-foot)-wide lanes with a 0.6-meter (2-foot) shoulder on each side. Existing road widths along the candidate routes for heavy-haul trucks include two 3.7-meter (12-foot) lanes and shoulder widths ranging from 0.3 to 0.6 meter (1 to 2-feet). The existing 3.7-meter wide lanes support maximum legal vehicle widths of 2.6 meters (8.5 feet). The proposed 4.3-meter lanes would be sufficient for a 3-meter (10-foot)-wide heavy haul transporter. The 0.6-meter shoulder width provides additional road width for the transporter in transit and would help reduce pavement "breakout" along the edge of the road. Truck turnouts would be used to remove a transporter from travel lanes, if needed. For details, see *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998).

The analysis of potential road upgrades presented in *Road Upgrades for Heavy Haul Truck Routes – Design Analysis* (DIRS 154448-CRWMS M&O 1998) identifies that the average rate of speed for the heavy-haul vehicles at low grades similar to those on U.S. 95 is between 56 kilometers (35 miles) per hour and 68 kilometers (42 miles) per hour. At that speed, the transporters would pass turnouts that were spaced 8 kilometers (5 miles) apart approximately every 7 to 8 minutes. Therefore, based on this short travel time between turnouts, the few shipments of this type each day, and the limited amount of traffic of other vehicles along the candidate highways, DOE believes the spacing of turnouts would be sufficient to allow queued vehicles to pass and would not adversely affect highway safety. In areas of steeper upgrades, DOE assumed truck lanes would be constructed.

Although proposed road upgrades to allow use of such trucks would mitigate impacts on congested roads, traffic flow, and highway infrastructure, before DOE used a heavy-haul truck transportation implementing alternative it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways.

Section 2.1.3.3.3.2 of the EIS discusses operations of heavy-haul trucks. Section 3.2.2.2.1.1 describes existing traffic on candidate heavy-haul truck routes. Section 6.3.3.1 discusses heavy-haul truck impacts, stating "even with the highway upgrades, heavy-haul trucks would cause delays for other vehicles because of their size and slower travel speeds." Section 6.3.3.1 presents estimates of traffic fatalities associated with heavy-haul truck operations for the five candidate routes.

8.5.3 (4419)
Comment - EIS001472 / 0007
The draft EIS also does not consider the potential of heavy haul truck transportation, and yet we know from the PFS [Private Fuel Storage] facility discussion that's proposed that that's one of the alternatives that will be considered. Recognizing the impact of the PFS facility at Yucca Mountain, those considerations are also to be taken into account.

Response
Similar to the proposed Private Fuel Storage project, DOE has considered the potential of heavy-haul truck transportation in Nevada in Section 6.3.3 of the EIS. Section 6.2 includes the impacts of using heavy-haul trucks to transport rail casks containing spent nuclear fuel from 24 commercial sites that are not served by a railroad to nearby railheads. In addition, the EIS considers the cumulative impacts from the proposed Private Fuel Storage project in Section 8.4.

8.5.3 (5286)
Comment - EIS000968 / 0007
What are the operational characteristics of the proposed heavy-haul system? If heavy-haul trucks are used, how will they effect traffic? It could only move 25-35 miles per hour, on our highways the speed limits are 65 or 75 mph, how many accidents will this cause? Will it warrant additional lane construction? What about where the roads are only two-lanes? How often and by whom will these trucks be inspected? Does the inspection require special tools/equipment? If it breaks down who fixes it and are there special parts needed? Where do they come from? Is there additional radioactive exposure while it sits? Who measures it and with what equipment?

The last several questions also apply to legal weight trucks.

Response
At this time, the heavy-haul truck implementing alternatives for transporting spent nuclear fuel and high-level radioactive waste to the proposed repository are conceptual. Section 2.1.3.3.3.2 of the EIS shows a concept for such a heavy-haul truck. Proposed road upgrades to allow use of such trucks, such as improvements to pavement and construction of turnouts and truck passing lanes, would mitigate impacts on congested roads, traffic flow, and highway infrastructure. However, before DOE used a heavy-haul truck transportation implementing alternative it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways.

Section 2.1.3.3.3.2 of the EIS discusses operations of heavy-haul trucks. Section 3.2.2.2.1.1 describes existing traffic on candidate heavy-haul truck routes. Section 6.3.3.1 discusses heavy-haul truck impacts, stating "even with the highway upgrades, heavy-haul trucks would cause delays for other vehicles because of their size and slower travel speeds." Section 6.3.3.1 presents estimates of traffic fatalities associated with heavy-haul truck operations for the five candidate routes.

DOE would comply with Commercial Vehicle Safety Alliance standards for all truck (heavy-haul and legal-weight) inspections. Federal regulations (49 CFR 397.17) cover hazardous materials transportation inspection of tires. These inspections are required before departure and at regular intervals. Motor carriers are required to conduct load inspections during transport within the first 40 kilometers (25 miles) and after 3 hours or 240 kilometers (150 miles) of transport (49 CFR 392.9). Drivers usually perform these inspections.

Heavy-haul truck transport would require maintenance personnel to assist in the event of breakdowns. At this time, DOE has not determined how, where, or if, maintenance personnel would be positioned along routes.

There could be additional radioactive exposure to transport crews in the event of a vehicle break down. Maintenance personnel would be exposed, with the amount of exposure depending on the length of time required to fix the vehicle. However, the amount of radioactive exposure would be small – within allowable limits set by DOE. Radiological exposure of vehicle crew members and DOE or DOE contractor personnel working near a transportation cask would be subject to controls of a radiological health and safety protection program, which DOE would establish. Radiological exposures would be managed to remain within DOE radiological exposure guidelines.

8.5.3 (5303)
Comment - EIS001887 / 0040
The Draft EIS fails to demonstrate the feasibility of the unprecedented large-scale, long duration heavy-haul transport of SNF [spent nuclear fuel] and HLW [high-level radioactive waste] on public highways. It misrepresents the operational complexity of such shipments; grossly underestimates the amount and cost of infrastructure

improvement required along Nevada highways; and contains an incomplete and inadequate analysis of potential heavy-haul truck (HHT) routes.

Nevada believes that the use of heavy-haul trucks for thousands of shipments of spent nuclear fuel from any of the proposed intermodal transfer facility sites to Yucca Mountain is infeasible and dangerous. The costs associated with highway construction and improvements would be prohibitive, if the necessary infrastructure modifications could be made at all. The disruption to traffic flows and the accident risks posed by these massive, slow-moving, multiple unit vehicles and their escorts would pose unacceptable and unmitigable problems for Nevada's highways. In addition, the frequency of heavy-haul trips required to deliver waste and return the empty vehicle to the intermodal facility would place an unprecedented and unacceptable burden on Nevada's highway transportation infrastructure.

The Draft EIS should have evaluated heavy-haul transport in Nevada against the other alternatives for delivering spent fuel and HLW to Yucca Mountain, and DOE should have determined that such shipments are costly and impractical at best, dangerous and irresponsible at worst. Simply examining the heavy-haul option as a stand-alone alternative, as the Draft EIS does, is inadequate.

Response
In developing its concept for heavy-haul truck transportation in Nevada of large rail shipping casks containing spent nuclear fuel, DOE solicited and obtained information from several companies that routinely use heavy-haul trucks to transport large and heavy equipment. DOE's conceptual operating plans for heavy-haul truck operations involving up to 11 trips per week are based on this input and the experience of these companies in transporting similar size and weight loads both in one-of-a-kind and multiple shipments. Based on this information, DOE believes that use of heavy-haul trucks to transport spent nuclear fuel contained in large rail casks over highways in Nevada would be feasible and could be accomplished without causing large impacts to Nevada transportation infrastructure or the flow of traffic on Nevada highways. In fact, DOE believes that improvements to highway infrastructure that could be made to make routine use of heavy-haul trucks possible could benefit transportation in the State.

In addition to obtaining information from others, DOE employed qualified engineers to conduct mile-by-mile analysis of existing highways in Nevada that would be used for each of the five candidate routes for heavy-haul trucks. This analysis included an evaluation of each candidate route for Nevada Department of Transportation restrictions on axle loading. Using this information, the concept design of a heavy-haul truck, and information obtained from the Nevada Department of Transportation, DOE developed a conceptual design-level engineering analysis that identified potential road upgrades. With the upgrades that this analysis estimated could be needed, the five candidate routes for heavy-haul trucks evaluated in the EIS would be placed in the highest category of allowable axle loading published by Nevada Department of Transportation. DOE used the engineering and operations information developed in these studies to develop cost estimates for the highway upgrades, highway maintenance, and shipments using heavy-haul trucks. These cost estimates, which DOE believes are reasonable and realistic, are the basis for estimating socioeconomic impacts discussed in Section 6.3.3 of the EIS.

Section 6.3.3 of the EIS identifies potential traffic impacts and health and safety risks of transporting spent nuclear fuel in Nevada using heavy-haul trucks. The analysis in this section observes that even with highway upgrades, DOE anticipates that use of heavy-haul trucks would cause some delay in the free flow of highway traffic. Tables 2-10 and 2-11 provide side-by-side presentations of estimated impacts in Nevada of using a branch rail line in each of five candidate rail corridors and of using heavy-haul trucks on each of five candidate routes to transport spent nuclear fuel.

8.5.3 (5406)
Comment - EIS001887 / 0109
Page 2-50; Section 2.1.3.3.3 - Nevada Heavy-Haul Truck Scenario

Heavy-haul vehicles of the type and quantity described in the heavy-haul truck scenario present significant concerns and impacts not addressed in the Draft EIS. Training for inspectors to properly inspect these unique vehicles must be scheduled and performed in a timely manner to insure the safety of all concerned. Vehicle inspection areas must be established at the intermodal transfer station and include appropriate equipment, manpower, and environmentally safe employee working areas.

Escorts for these heavy-haul vehicles will not only provide the usual escort responsibilities, but will also include responsibilities to control and clear large expanses of roadway and conduct preventative sweeps ahead of the load, keeping other traffic moving in an orderly fashion, and interacting with security teams.

Impacts from non-fatal (injury/property) accidents are not addressed in the Draft EIS. However, it is likely that most accidents involving heavy-haul truck (and legal-weight truck) shipments would cause injury or property damage, rather than fatalities.[21] These accidents will have a substantially larger impact than portrayed in the Draft EIS, especially with traffic congestion, reduced travel lane expectancy, and the necessity to reroute traffic due to highway blockage.[22]

The projected speed of 20 to 30 miles per hour for heavy-haul vehicles is highly optimistic, especially during peak or congested traffic periods. The Nevada Highway Patrol estimates that a more realistic speed would be 12 to 18 miles per hour, which will significantly increase traffic congestion and disruption along affected highways.

[21] Section 6.2.4.2.1

[22] See Attachment S for comparing fatal and injury crash rates for large trucks.

Response

Inspections for heavy-haul truck shipments would be completed at the intermodal transfer station and at the Yucca Mountain site prior to and after transport in accordance with Commercial Vehicle Safety Alliance standards, U.S. Department of Transportation regulations, Nuclear Regulatory Commission regulations and applicable state and local codes and standards. During transport, heavy-haul vehicles would make periodic stops for inspections at Commission-approved areas (approved in accordance with Commission safeguards and security regulations in 10 CFR Part 73) and in accordance with U.S. Department of Transportation regulations (see 49 CFR 397.17 and 392.9). Personnel completing inspections would receive training specific to their job function prior to transportation. Escorts used in heavy-haul truck transportation would maintain allowable distances from the heavy-haul vehicles in accordance with Nevada Administrative Codes (see NAC 484.545) and permitting requirements. Escorts used in transport could be used for security in accordance with Nuclear Regulatory Commission regulations (see 10 CFR 73.37). The EIS assumes the use of escorts discussed here. It therefore includes analysis of impacts to the health and safety of this group of workers and of the socioeconomic impacts of the escort jobs.

Potential impacts from operation of the heavy-haul vehicles, including impacts on traffic congestion, are presented in Section 6.3.3 of the EIS. These impacts include estimates of traffic fatalities that could occur for the heavy-haul truck implementing alternatives. Traffic fatality estimates are also presented for commuting workers. Fatalities were used as the measure of the total impact because non-radiation-related traffic fatalities can be combined with radiation-related latent cancer fatalities to yield an estimate of the total number of fatalities for the Proposed Action and the No-Action Alternative. In contrast, combining non-radiation-related measures of impact such as traffic related injuries, illnesses, and other environmental impacts with radiation-related latent cancer fatalities would not yield an easily understandable estimate of total impacts. For the same reason, genetic effects, nonfatal cancers, and other radiation effects were not included in the estimates of the total impact.

The EIS analysis assumed that heavy-haul transport vehicles would utilize two tractors with a reference design of 650 horsepower each. With this reference design, transporter travel times were calculated based on input from commercial operators of overweight and overdimensional vehicles similar to the vehicles in consideration. The estimated speeds of the transported were calculated based on road grade. Estimated heavy-haul transport vehicle speeds ranged from 68 kilometers (42 miles) per hour at a zero-percent grade to 10 kilometers (6 miles) per hour at a 6-percent inclined grade (see DIRS 154448-CRWMS M&O 1998). For the highways in Nevada that would be used, DOE assumed truck lanes would be constructed in areas with road sections longer than 61 meters (200 feet) having grades greater than 4 percent. It also assumed turnout lanes would be constructed on each side of the road at intervals of 8 to 32 kilometers (5 to 20 miles) depending on a route's average daily traffic (see CRWMS M&O 1998). These truck lanes and turnouts would alleviate traffic congestion behind slower moving transport vehicles.

8.5.3 (5730)
Comment - EIS001887 / 0338
Page 6-96; Section 6.3.3.1 - Impacts Common to Nevada Heavy-Haul Truck Implementing Alternative

Incident-Free Transportation

The Draft EIS does not adequately evaluate the radiological impacts of routine HHT [heavy-haul truck] transportation. The Draft EIS appears to significantly underestimate HHT routine radiation exposures to the general public, especially in Tonopah, Goldfield, Beatty, and other locations where residences and businesses are located within 25 to 200 feet of the U.S. 95 road shoulder. The RADTRAN model is not sufficiently sensitive to local conditions and probable HHT operating characteristics. DOE must recalculate the annual and cumulative collective dose and maximum individual dose, assuming a range of HHT speeds and stop-times. The analysis must consider the actual location of all occupied buildings within ¼ mile of the route. The analysis must accurately reflect the actual population within ¼ mile of the route during daylight hours on week days, including children in schools and nonresidents in hotels and commercial establishments. Nevada believes that numerous individuals could receive annual doses from HHT operations equal to ten to thirty percent or more of annual background radiation exposures.

Response
Section 6.3.3 of the EIS presents estimates of radiological impacts for each of the five alternative routes in Nevada. Section J.3.1.2 describes calculation parameters used for each of the Nevada routes including distances through rural, suburban, and urban areas along the routes and the populations along each route. Tables of times, speed, and distances used in estimating parameters for the analysis of impacts are provided in *Road Upgrades for Heavy Haul Truck Routes* (DIRS 154448-CRWMS M&O 1998). Estimated speeds through towns and around sharp corners for heavy-haul trucks range from 8 to 24 kilometers (5 to 15 miles) per hour. The analysis used route-specific data such as length and population within 800 meters (about 2,600 feet) of the route provided by a Geographic Information System analysis. To estimate the risks, DOE used accepted methods and data that it has used in other recent environmental documents.

In addition, in responding to public comments regarding individuals in Nevada who live close to candidate transportation routes, DOE used information from a recent report prepared for the City of North Las Vegas (DIRS 155112-Berger Group 2000). This report presents suggested assumptions for a hypothetical maximally exposed individual who lived 15 meters (49 feet) from a roadway used by heavy-haul trucks and who would be present and stay at that location, when, over the 24 years, each shipment stopped for 1 minute. DOE believes that such an exposure scenario is highly unlikely and therefore unrealistic. Nonetheless, DOE estimated the maximum cumulative radiation dose to this hypothetical individual would be about 520 millirem over 24 years of the Proposed Action (see Section J.1.3.2.2.1 of the EIS). This dose would lead to an estimated increase in risk of cancer of 1 in 4,000 over the individual's lifetime. The analysis in the EIS considered other potential maximally exposed individuals who could live along routes in Nevada. These included:

- A person in Alamo living in a residence approximately 5 meters (15 feet) from U.S. 93 where heavy-haul trucks could pass who could receive a dose of 25 millirem over 24 years;

- A person who could be in the courthouse or fire station in Goldfield, Nevada approximately 5 meters (15 feet) from U.S. 95 where heavy-haul trucks could pass, who could receive a dose of 56 millirem over 24 years;

- A person who would live at the edge of a 60-meter wide (196 feet) right-of-way for a branch rail line where all rail shipments would pass, who could receive a dose of 2 millirem over 24 years; and

- A person who would live in southern Nevada approximately 11 meters (35 feet) from a roadway used by legal-weight trucks who could receive a dose of 20 millirem over 24 years.

For perspective, cancer from all other causes is fatal to about 1 in 4 persons.

DOE believes that the risks of transporting spent nuclear fuel and high-level radioactive waste in Nevada to Yucca Mountain would be very small for the Proposed Action and for the Inventory Modules.

Should the heavy-haul truck scenario be selected, additional engineering and environmental studies could be conducted as a basis for detailed design and appropriate National Environmental Policy Act reviews. These studies would be used in selecting final roadways, upgrades, and associated facilities for heavy-haul trucks. Consultation with responsible agencies and interested stakeholders would provide for input to these studies and become part of the National Environmental Policy Act reviews.

8.5.3 (7048)
Comment - EIS001847 / 0006
The DEIS fails to address the fact that the number of shipments and the amount of radioactive material that will be shipped is unprecedented in world history. About 90% of the volume would be spent fuel from nuclear power plants, and virtually none of this type of material has ever been shipped before.

Response
Of the thousands of spent nuclear fuel shipments completed over the last 30 years, none has resulted in an identifiable injury from the release of radioactive material. Future shipments will be conducted under the same regulations that have contributed to the safe transportation of more than 2,700 shipments conducted in this country over the last 30 years. For additional information on the regulations, procedures, and equipment that would be followed and used to ensure this safety record continues with shipments to a repository, see Appendix M to the EIS.

8.5.3 (7187)
Comment - EIS001337 / 0076
Page 2-51 Section 2.1.3.3.3.2. This section [should] provide an indication of maximum and minimum speeds that heavy-haul trucks will travel. The length of time to complete trip for each route should be discussed.

Response
The maximum and minimum speeds, and route travel times are included in *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998). A review of information in this report indicates that the travel speeds would range from about 16 kilometers (10 miles) per hour on steep grades and through towns to about 65 kilometers (40 miles) per hour on open highways. Each table lists the mileage by road condition type, the speed over the section, and the time to travel the section. This information includes inspection stops and intersections to be navigated on each route and were used for estimating road upgrades and operating plans. Section 6.3.3.2 of the EIS presents estimated travel times for heavy-haul trucks for each of the five candidate routes for heavy-haul trucks in Nevada.

8.5.3 (7653)
Comment - EIS001912 / 0097
Heavy haul truck options. There is no indication of roadway wear and the cost to upgrade and maintain this type of facility. Will DOE commit to roadway and other improvements needed? Is the Nevada Department of Transportation a cooperating agency on this DEIS? Has DOE discussed the infrastructure improvements needed for a heavy haul route?

Response
Section J.3.1.2 of the EIS lists potential upgrades for the five candidate heavy-haul truck implementing alternatives in Nevada. This information is summarized from *Road Upgrades for Heavy Haul Routes* (DIRS 154448-CRWMS M&O 1998). Estimates of costs to upgrade and maintain the highways that would be used over 24 years for the Proposed Action are detailed in *Cost Estimate for Heavy Haul Truck Transport Design* (DIRS 154675-Ahmer 1998). Section 2.1.5 , Table 2-5, lists the estimated project lifetime cost of up to $800 million for transportation in Nevada. This project cost includes costs of upgrading and maintaining highways for heavy-haul trucks. The Nevada Department of Transportation was not a cooperating agency for the EIS. Personnel from DOE and the Nevada Department of Transportation have informally discussed highway upgrades needed to support use of heavy-haul trucks to transport spent nuclear fuel to Yucca Mountain.

8.5.3 (7941)
Comment - EIS001903 / 0008
P. 6-5, text box. “Nine-axle tractor-trailer truck (steering axle and three drive axles on the tractor and three axles on the trailer)….” 1+3+3 is 7, not 9.

Response
The error has been noted and a correction to reflect a seven-axle tractor-trailer has been included in the Final EIS.

8.5.3 (8405)
Comment - EIS001873 / 0071
P. 6-115. I fail to see what objective could be accomplished by heavy-haul from Caliente to Las Vegas.

Response
Section 2.1.3.3.3 of the EIS describes five transportation implementing alternatives that would use heavy-haul trucks to transport spent nuclear fuel and high-level radioactive waste in Nevada. The Caliente/Las Vegas heavy-haul truck route is one of these, which include routes that would be longer and shorter. Section 6.3.3.2.3 describes the potential impacts of upgrading and maintaining highways, constructing an intermodal transfer station, and making shipments using heavy-haul trucks on the route. DOE included this route in the EIS because it is one of three feasible routes that could be used for shipments of spent nuclear fuel contained in rail casks and that would be transferred from railcars to heavy-haul trucks at an intermodal transportation station in Caliente, Nevada. DOE believes the Caliente-Las Vegas route could meet the requirements of the U.S. Department of Transportation requirements for shipments that would originate at a Caliente intermodal transfer station.

8.5.3 (9425)
Comment - EIS001888 / 0116
In addition, the DEIS did not analyze the effects that construction of the heavy haul infrastructure improvements or a rail line would have on the Regional Transportation Plan of Clark County.

Response
Sections 6.3.2 and 6.3.3 of the EIS discusses the potential impacts from Nevada rail and heavy-haul truck implementing alternatives (respectively), including the potential impacts of construction and infrastructure improvements. For the three candidate heavy-haul truck routes through the Las Vegas Valley, DOE assumed the use of the Las Vegas Beltway. For these implementing alternatives, the applicable segment(s) of the Beltway would be completed in time for the beginning of shipments approximately 10 years earlier than the current Clark County estimate for completion in 2020. The assumption used is that this would reduce traffic congestion in the Las Vegas Valley, and would thereby promote the objectives of the Regional Transportation Plan of Clark County. In fact, DOE believes that improvements to highway infrastructure that could be made to make routine use of heavy-haul trucks possible could benefit transportation in the County. In addition, should DOE select one of the three candidate heavy-haul truck implementing alternatives that would use highways in Clark County, additional engineering and environmental studies could be conducted as a basis for detailed design and appropriate National Environmental Policy Act reviews. These studies would be used in selecting final roadways, upgrades, and associated facilities for heavy-haul trucks. DOE would consult with the County regarding the specific impacts to the transportation system that would be caused by the associated highway improvements and use of heavy-haul trucks.

DOE assumed construction and use of a branch rail line in Clark County, in either the Jean or the Valley Modified Corridor, would not disrupt highway traffic. Construction of grade separations over existing highways would have the largest, although temporary, impact on traffic flow. However, grade separations that would be needed are well outside the Las Vegas Valley area.

DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

8.5.3 (10804)
Comment - EIS002043 / 0006
The EIS needs to address what corrective measures will be taken to make the right bend just south of the center of the Town of Goldfield safe for other drivers. In addition, there is insufficient room for the heavy-haul transporter to

pull over to the side of the highway in the more populated business district of Goldfield. If the transport vehicle had a breakdown in Goldfield, there would be no place to pull the vehicle to the side and out of the way of the travel lane. This situation could be mitigated by constructing a roadway that by-passes the center of Goldfield. The EIS should include a by-pass route and address methods for mitigating any potential adverse socioeconomic impacts of a by-pass.

Response
Section 6.3.3.2.1 of the EIS discusses the potential impacts of implementing the Caliente heavy-haul truck implementing alternative. The analysis of this candidate route is based on information contained in *Road Upgrades for Heavy Haul Truck Routes – Design Analysis* (DIRS 154448-CRWMS M&O 1998). The report estimates the needs for highway upgrades including improvements to the Goldfield curve discussed by the commenter. Based on the analysis, a heavy-haul truck such as the one illustrated in Section 2.1.3.3.3.2 could negotiate the curve although in the course of making the turn the vehicle would have to encroach into the opposing lane. The Department's analysis suggests the curve could be widened (both shoulders) so that transit by the heavy-haul vehicles would not require stopping opposing traffic. DOE considered the alternative of constructing a by-pass around Goldfield. However, after preliminary engineering analysis and consideration of vehicle turning capabilities for up to a 140-metric-ton (150-ton) payload DOE concluded a bypass would not be necessary. Nonetheless, although proposed road upgrades to allow use of heavy-haul trucks would mitigate impacts on congested roads, traffic flow, and highway infrastructure, before DOE used a heavy-haul truck transportation implementing alternative it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways.

8.5.3 (11007)
Comment - EIS001896 / 0005
Section 2.1.3.3.3.2

The heavy-haul trucks would travel north on I-15 from the Sloan interchange. The trucks would then exit on the beltway and travel northwest to Yucca Mountain. This route could affect potential annexation areas.

Response
Section 2.1.3.3.3 of the EIS describes the Nevada heavy-haul truck implementing alternatives including the Sloan/Jean route for heavy-haul trucks and intermodal transfer station. Section 6.3.3 discusses the potential impacts, including land use of the Nevada heavy-haul truck transportation implementing alternatives. A Sloan/Jean route would originate from an intermodal transfer station located along the mainline Union Pacific track near Jean. Another possibility would be for the route to originate at an area along the Railroad's mainline near the town of Sloan. Both areas are currently public lands managed by the Bureau of Land Management. The Department is not aware of any plans for annexation in these areas. Should a heavy-haul truck implementing alternative be selected and prior to a specific route and intermodal station location being chosen, further engineering and National Environmental Policy Act analysis could be required. Such analyses would address the potential for land-use impacts. Should DOE select one of the Sloan/Jean heavy-haul truck implementing alternative, additional engineering and environmental studies could be conducted as a basis for detailed design and appropriate National Environmental Policy Act reviews. These studies would be used in selecting final roadways, upgrades, and associated facilities for heavy-haul trucks. DOE would consult with the County and other cognizant agencies regarding specific impacts that would be caused by the associated highway improvements, construction and use of an intermodal transfer station, and use of heavy-haul trucks.

8.5.3 (11017)
Comment - EIS001896 / 0015
Section 3.2.2.2.11

The implementation of the Sloan/Jean heavy-haul route would impact already congested roads. Level of service E&F are currently experienced on Sloan/Jean route.

Response
As noted in Section 6.3.3.1 of the EIS, DOE acknowledges this potential impact. The EIS states that operations of heavy-haul trucks on routes through the Las Vegas valley would cause delays for other vehicles due to the size and

speed of the heavy-haul vehicles and the associated escorts. However, the Department assumes requirements for heavy-haul truck operations that would be contained in permits issued by the Nevada Department of Transportation would include time-of-day and day-of-the-week restrictions to reduce impacts of heavy-haul trucks on traffic congestion.

8.5.3 (11292)
Comment - EIS001814 / 0021
DEIS Page 2-50
Under this scenario, rail shipments to Nevada would go to an intermodal transfer station where the shipping cask would transfer from the railcar to a heavy-haul truck. The heavy-haul truck would travel on existing roads to the repository.

DOE has not demonstrated that heavy-haul truck is a feasible option to transport railroad casks to the proposed repository. States are required to enforce weight and size limitations on Interstate System and on routes providing reasonable access to and from the interstate. The penalty for failure to do so is the withholding of a State's National Highway System apportionment. States may issue permits for overweight and/or oversize vehicles if the load meets the definition of a nondivisible load as defined at 23 CFR Part 658:

Nondivisible load or vehicle.
(1) As used in this part, nondivisible means any load or vehicle exceeding applicable length or weight limits which, if separated into smaller loads or vehicles, would:

(i) Compromise the intended use of the vehicle, i.e., make it unable to perform the function for which it was intended;

(ii) Destroy the value of the load or vehicle, i.e., make it unusable for its intended purpose; or

(iii) Require more than 8 workhours to dismantle using appropriate equipment. The applicant for a nondivisible load permit has the burden of proof as to the number of workhours required to dismantle the load.

(2) A State may treat emergency response vehicles and casks designed and used for the transport of spent nuclear materials as nondivisible vehicles or loads.

The decision as to whether or not to treat casks for the transport of spent nuclear materials is left to the discretion of the states. The Federal Highway Administration (FHWA) adopted a single definition of nondivisible loads to apply to both oversize and overweight loads, since "Congress has authorized the States, in identical terms, to issue overweight and oversize permits 'for those vehicles and loads which cannot be easily dismantled or divided [(23 U.S.C. 127(a); section 4006(a) of the ISTEA, 49, U.S.C. app. 2311(j)(1)].'" (58 *FR* 11455)

Casks designed and used for the transport of spent nuclear materials were added to the definition of nondivisible loads in the preamble to the final rule. FHWA stated, "Spent Nuclear Fuel: The Pennsylvania DOT [Department of Transportation] pointed out that the FHWA informed the American Association of State Highway and Transportation Officials (AASHTO) several years ago that the FHWA regarded overweight casks used to move spent nuclear fuel as nondivisible. This determination was not reflected in the SNPRM (Supplemental Notice of Proposed Rule Making). The casks used to transport spent nuclear materials, especially nuclear fuel, are extraordinarily strong and heavy, both to prevent a release in case the transporter vehicle was involved in an accident and to block radiation that would penetrate lighter materials. Some of these containment devices can make a vehicle overweight even before the nuclear materials are loaded. These vehicles cannot be used for any other cargo or reduced to legal weights without frustrating their purpose. A new provision has therefore been added which essentially states that specially designed casks used to move spent nuclear fuel meet the definition of a nondivisible load." (59 *FR* 30409)

In the Supplemental Notice of Proposed Rule Making, FHWA stated: "Nonetheless, nondivisible load permits should be used sparingly. Loads which are inherently divisible, including bulk items such as liquids, grain, or cement, would not qualify as 'nondivisible.' Nor would shipments consisting of more than one of a unit item or

assemble, which by itself may be nondivisible. In such cases, items can be removed until the load meets the legal limits. Nondivisible load permits are not 'loopholes' in Federal law, and the FHWA expects to see the number of nondivisible load permits stabilize or even decline in the next few years." (58 *FR* 11457)

FHWA further clarified the intent of the definition of nondivisible loads with an additional example. "A similar argument has been made, although not in this rulemaking, that tank vehicles weighing more than 80,000 pounds should be eligible for nondivisible-load overweight permits because a partially loaded tank of legal weight is susceptible to cargo surge that can make the vehicle unstable and even cause accidents in turns or emergency maneuvers. By this reasoning, a nondivisible-load overweight permit would be authorized to increase safety. Proponents of this position do not explain the reason tanker operators purchase vehicles that necessarily exceed applicable weight limits when fully loaded. It is certainly true that tank trucks must be operated with particular care; that is the reason the FHWA's commercial driver's license regulations require drivers of these vehicles to obtain a special endorsement. But the fact is that liquids, like two concrete panels, are easily divisible. If a safety element were added to the definition of nondivisible load, the concept of nondivisibility could lose all meaning if economic interests were to masquerade as safety issues." (59 *FR* 11457)

FHWA's intent when adopting the definition of nondivisible loads was to reduce the number of permits issued for overweight and oversize vehicles. Casks for transporting spent nuclear fuel were added to the definition of nondivisible since the design of the cask requires heavy materials for strength and shielding, resulting in some cases, for the need for overweight vehicles. This definition, however, clearly applies to casks that were designed for highway transport, not those designed for rail. In the Supplemental Notice of Proposed Rulemaking, FHWA stated that "shipments consisting of more than one of a unit item or assembly, which by itself may be nondivisible," are not considered nondivisible. DOE can transport the material in casks that meet the requirements for legal weight and size trucks, they are simply proposing to ship "more than one of a unit item or assembly" by putting many more fuel rod assemblies in a cask designed for rail than they could with legal weight truck casks.

In FHWA's example of tank vehicles, they also noted that "the concept of nondivisibility could lose all meaning if economic interests were to masquerade as safety issues." In this case, DOE is not even claiming a safety benefit for the use of rail casks, but rather just one of convenience. Since the use of rail casks is clearly optional, and the material could be shipped in legal weight casks, DOE's proposed use of rail casks transported on overweight and oversize vehicles clearly does not meet the definition of nondivisible load, and does not qualify for an overweight and oversize permit based upon nondivisibility of the load.

Response
Section 2.1.3.3.3 of the EIS describes the Nevada heavy-haul truck scenario and Sections 6.3.3.1 and 6.3.3.2 provide the results on the impacts analysis. Should heavy-haul truck mode be selected, detail engineering and environmental studies would be conducted to provide the basis for detailed design. During these studies, consultations with Federal, State, tribal and local authorities would be initiated to address regulatory, permitting and related issues. Heavy-haul truck permitting would be one topic for consultation with the Nevada Department of Transportation. Those detailed consultations have not yet occurred. However, the definition of "nondivisible loads" pertaining to transportation casks for the transportation of spent nuclear fuel and high-level radioactive waste has been addressed in the preamble to the *Federal Register* Notice that added the 23 CFR 658.5 definition. In general, this definition says that any cask that can be transported on the highways fits the definition of 23 CFR 658.5. This holds true even if the cask must be transported on a heavy-haul truck. This has been acknowledged by the Office of Freight Management and Operations in the Federal Highway Administration, U.S. Department of Transportation.

8.5.3 (11294)
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The station would accept railcars as they arrived (24 hours a day, 7 days a week), but it would normally dispatch heavy-haul trucks during early morning daylight hours on weekdays, consistent with current Nevada heavy-haul shipment regulations.

The EIS does not contain sufficient information on the schedule of arriving shipments to the station and the schedule on dispatch of heavy-haul trucks from the station to allow an evaluation of the impacts. During winter time, the restriction on travel during daylight hours will significantly limit the time available for travel from the station to the

proposed repository. In December, for example, there are only about 10 daylight hours available for travel. Depending on the location of the intermodal transfer station, dispatch of the heavy-haul trucks in the "early morning daylight hours" could result in heavy-haul trucks traveling through the Las Vegas urban area during rush hour.

The EIS does not provide any information on the impact of limiting travel to weekdays. Given the restriction on travel during daylight hours, this means that casks arriving at the station Friday through Monday morning cannot be dispatched until Monday morning. To comply with NRC [Nuclear Regulatory Commission] requirements, a significant number of heavy-haul trucks will have to be dispatched on Monday mornings. The EIS should provide information on this scheduling requirement, and include an evaluation of the impacts of having multiple heavy-haul trucks dispatched during a short time-frame on Monday mornings. Since travel is also prohibited on holidays, this problem will be even worse over three-day holiday weekends.

The number of casks arriving over a weekend could vary significantly depending on whether DOE decides to use general freight or dedicated trains. DOE should state in the EIS its preferred option for the type of service utilized so that an estimate of the number of railcars arriving over a weekend can be made to evaluate impacts of scheduling options. Conceivably, if DOE opts for dedicated train service, the dispatch of trains from shipping sites could be optimized to prevent an excessive number of casks arriving at the intermodal transfer site over weekends.

Response
DOE does not have detailed operational information regarding a concept of operations; however, conceptual level engineering analysis has been completed. For example, the document titled *Road Upgrades for Heavy Haul Truck Routes* (DIRS 154448-CRWMS M&O 1998), contains estimated travel times for the five heavy-haul truck routes identified in the Draft EIS. An assumption used in the EIS for the three routes originating from Caliente, Nevada would be a mid-route overnight parking area, because of the length of the routes, restricted nighttime travel, and allowance for operations contingencies. However, with the exception of the Caliente route, travel times for heavy-haul trucks are estimated to be less than 10 hours, including inspection stops.

For the Caliente/Las Vegas route, heavy-haul trucks leaving Caliente in the morning would arrive in the Las Vegas area at mid-day. Trucks using the Apex/Dry Lake route or Sloan/Jean route could avoid Las Vegas rush-hour traffic in the mornings and evenings. Both of these routes have estimated travel times of about 4 hours.

Regarding the use of dedicated versus general freight trains, Section J.2.3 of the EIS states, "DOE has not determined the commercial arrangements it would request from the railroads for shipment of spent nuclear fuel and high-level radioactive waste." Until this decision is made with sufficient shipment details, transportation logistics cannot be analyzed in detail with any accuracy. However, in its Draft Request For Proposal, *Acquisition of Waste Acceptance and Transportation Services for the Office of Civilian Radioactive Waste Management*, DOE stated, "The RSC [Regional Servicing Contractor] shall provide all transportation services to include heavy haul and intermodal transfer services that make maximum use of special rail service wherever reasonably possible" (DIRS 153487-DOE 1998).

8.5.3 (12195)
Comment - EIS000096 / 0008
The Draft EIS also ignores the potential impacts on Tonopah, Goldfield, and Beatty of legal-weight truck (LWT) shipments of SNF [spent nuclear fuel] and HLW [high-level radioactive waste]. US 6 from Ely to Tonopah and US 95 from Tonopah to Amargosa Valley are identified as potential state-designated preferred routes in Appendix J. According to the Draft EIS, there could be as many as 96,000 LWT shipments to the repository under the mostly truck scenario. The adverse impacts of these shipments would be similar to those of HHT [heavy-haul truck] shipments. The larger number of LWT shipments, averaging 5 to 10 trucks or more per day, could result in higher routine radiation exposures and heightened levels of risk.

Response
DOE believes that the risks of transporting spent nuclear fuel and high-level radioactive waste in Nevada to Yucca Mountain would be very small for the Proposed Action and for the Inventory Modules. Section J.3.1.3 of the EIS presents estimated impacts for the Proposed Action and for the approximately 53,000 shipments under the mostly legal-weight truck scenario if shipments used the routes described in a 1989 Nevada Department of Transportation report (DIRS 103072-Ardila Coulson 1989, all). The route identified as "Wendover via U.S. 95", which is

described in the section and includes U.S. 95 through Tonopah, Goldfield, and Beatty, is one of the routes evaluated as a sensitivity analysis. For this route, DOE estimated the total dose over 24 years to the population along the sections of Interstate-80, U.S. 93, U.S. 6, and U.S. 95 that make up the total route in the State would be about 900 person-rem. A dose of 900 person-rem to the affected population would be estimated to result in a 45-percent chance of 1 latent cancer fatality in the population over the 24 years of operations. The information was compiled to illustrate the sensitivity of impacts nationally and in Nevada to the potential use of different routes in Nevada. The analysis used State-specific data for rates of accidents on primary highways in Nevada for the segments of trips analyzed in these cases. The analysis also used route-specific data such as length and population within 800 meters (about 2,600 feet) of the route provided by a Geographic Information System analysis. To estimate the risks, DOE used accepted methods and data that it has used in other recent environmental documents.

8.5.3 (12548)
Comment - EIS001157 / 0009
A heavy-haul route through North Las Vegas and the Las Vegas Valley is not recommended. The costs of using such routes in terms of congestion and decreased air quality were not adequately addressed in the study.

Response
At this time, the heavy-haul truck implementing alternatives for transporting spent nuclear fuel and high-level radioactive waste to the proposed repository are conceptual. Section 2.1.3.3.3.2 of the EIS shows a concept for such a heavy-haul truck. Proposed road upgrades to allow use of such trucks, such as improvements to pavement and construction of turnouts and truck passing lanes, would mitigate impacts on congested roads, traffic flow, and highway infrastructure. In addition, Section 6.3.3 discusses impacts of implementing and using each of the proposed heavy-haul truck transportation implementing alternatives including potential impacts on the air quality in the Las Vegas air basin. However, before DOE used a heavy-haul truck transportation implementing alternative it would work with the State of Nevada to conduct engineering and environmental studies that would support detailed design and construction of upgrades to highways.

DOE believes that the EIS provides the environmental impact information necessary to make certain broad transportation-related decisions, namely the choice of a national mode of transportation outside Nevada (mostly rail or mostly legal-weight truck), the choice among alternative transportation modes in Nevada (mostly rail, mostly legal-weight truck, or heavy-haul truck with use of an associated intermodal transfer station), and the choice among alternative rail corridors or heavy-haul truck routes with use of an associated intermodal transfer station in Nevada. DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.

8.6 Rail Transport

8.6.1 DEDICATED TRAINS

8.6.1 (223)
Comment - 13 comments summarized
A number of commenters provided views on the type of train service that should be used for the transportation of spent nuclear fuel and high-level radioactive waste. There was a consensus among the commenters that dedicated trains should be used rather than general freight service; commenters listed the advantages of dedicated trains. The commenters stated that the Draft EIS does not make a decision between dedicated trains and general freight service. Several commenters indicated that DOE should state in the EIS whether the EIS is intended to support the decision between dedicated and general freight trains. One commenter suggested DOE should include the use of general freight and dedicated trains as separate alternatives in the description of the Proposed Action in the EIS.

Response
As indicated in the EIS, DOE believes that the mostly rail case, in which more than 95 percent of spent nuclear fuel and high-level radioactive waste would be shipped by rail, would most closely approximate the actual mix of truck and rail shipments. In addition, DOE has identified mostly rail as its preferred mode of transportation, both nationally and in Nevada. At this time, however, the Department has not identified a preference among the five candidate rail corridors in Nevada.